



UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/632,388	08/03/00	LI	850063.529

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MM91/0926

EXAMINER

EATON, K

ART UNIT PAPER NUMBER

2823

DATE MAILED: 09/26/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/632,388

Applicant(s)

LI ET AL.

Examiner

Kurt M. Eaton

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6, 7, 9, 10 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 9, 10 and 20-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claim 20 is rejected under 35 U.S.C. 102(e) as being anticipated by Wu et al..

In re claim 20, Wu et al. (U.S. Patent No. 5,747,381) (herein referred to as Wu) shows in Figures 1-4, for example, a semiconductor device substructure including a substrate (10); an oxide layer (12) disposed over the substrate in a pattern having a physical contour of at least one or more recessed portions and at least one or more extended portions; a layer of undoped silicate glass (20) disposed over the patterned oxide layer and having a physical contour of recessed and extended portions corresponding to the physical contour of the oxide layer; a layer of doped silicate glass (22) over the layer of undoped silicate glass and having a physical contour of recessed and extended portions corresponding to the physical contour of the layer of undoped silicate glass; and a first substantially planar layer of dielectric material (25) covering at least one or more of the recessed portions of the layer of the doped silicate glass, and exposing at least one or more of the extended portions of the layer of the doped silicate glass layer {column 3, line 38 - column 4, line 58}.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 6, 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo, as previously applied in the Office Action mailed 3/27/01.

5. Claims 21-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo.

In re claim 21, Kuo shows in Figures 3 and 4 a semiconductor device substructure including a substrate (10); an oxide layer (11) disposed over the substrate in a pattern having a physical contour of at least one or more recessed portions and at least one or more extended portions; a layer of undoped silicate glass (18) disposed over the patterned oxide layer and having a physical contour of recessed and extended portions corresponding to the physical contour of the oxide layer; layer of doped silicate glass (20) over the layer of undoped silicate glass and having a physical contour of recessed and extended portions corresponding to the physical contour of the layer of undoped silicate glass; a substantially planar layer (22) of dielectric material covering at least one or more of the recessed portions of the layer of the doped silicate glass {column 2, line 56 - column 3, line 7}.

Kuo does not show wherein the substantially planar layer includes a first substantially planar layer of dielectric material covering at least one or more of the recessed portions of the layer of doped silicate glass, and exposing at least one or more of the extended portions of the layer of the doped silicate glass layer and a second layer of dielectric material covering the first substantially

Art Unit: 2823

planar layer of dielectric material and being in direct contact with the at least one or more extended portions of the layer of the doped silicate glass layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to consider the substantially planar layer of Kuo as two separate layers (i.e., first a substantially planar layer of dielectric material covering at least one or more of the recessed portions of the layer of doped silicate glass, and exposing at least one or more of the extended portions of the layer of the doped silicate glass layer and a second layer of dielectric material covering the first substantially planar layer of dielectric material and being in direct contact with the at least one or more extended portions of the layer of doped silicate glass layer) since separating what was formerly a singular layer into separate layers when: (a) the differences between using a single insulating layer made of one kind of material and two consecutively formed layers made of identical material; and (b) any unexpected results of providing a planar interface between the two layers at one elevation over the substrate as opposed to non-planar interface at another elevation are not apparent, would involve only routine skill in the art.

In re claim 22, Kuo shows wherein the layer of doped silicate glass is a layer of borophosphorous silicate glass {column 2, line 56 - column 3, line 7}.

In re claim 23, Kuo shows wherein the first layer of dielectric material is a layer of PETEOS {column 2, line 56 - column 3, line 7}.

In re claim 24, Kuo shows wherein the second layer of dielectric material is a layer of PETEOS {column 2, line 56 - column 3, line 7}.

In re claim 25, Kuo shows wherein the second layer of dielectric material is substantially planar {column 2, line 56 - column 3, line 7}.

In re claim 26, Kuo shows wherein the borophosphorous silicate glass has a thickness between approximately 2,000 and 8,000 Å {column 2, line 56 - column 3, line 7}.

In re claim 27, Kuo substantially discloses the invention as claimed but fails to show wherein a combined thickness of the oxide layer and the pre-metal dielectric stack is less than approximately 15,000 angstroms.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the combined thickness of the oxide layer and the pre-metal dielectric stack such that it was less than approximately 15,000 Å since thicknesses of dielectric materials are well known processing variables and discovering the optimum or workable range involves only routine skill in the art.

Response to Arguments

6. Applicant's arguments filed 6/27/01 have been fully considered but they are not persuasive.

7. Applicant contends it is unreasonable to suggest that separating the single layer of PETEOS into multiple layers as recited in claim 1 would have been obvious at the time the invention was made because Kuo and the applicants admitted prior art fail to show multiple layers of PETEOS as recited in claim 1 and because neither Kuo nor the applicants admitted prior art has suggested any motivation to have use for multiple layers of PETEOS, as recited in claim 1.

8. The examiner respectfully submits the teachings of the applicants admitted prior art were never relied upon in the Office Action mailed on 3/27/01. Accordingly, what the applicants admitted prior art teaches is irrelevant with respect to the disclosure of Kuo (one could quite easily take nearly any other prior art reference and correctly state that it fails to show multiple layers of PETEOS, as recited in claim 1). Furthermore, and in response to applicant's argument that there is

Art Unit: 2823

no suggestion to motivate one of ordinary skill in the art to use multiple layers of PETEOS, as recited in claim 1, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves **or in the knowledge generally available to one of ordinary skill in the art.** See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it was stated that motivation to meet the limitations recited in claim 1 is within the knowledge generally available to one of ordinary skill in the art. More specifically that separating what was formerly a singular layer into separate layers when: (a) the differences between using a single insulating layer made of one kind of material and two consecutively formed layers made of identical material; and (b) any unexpected results of providing a planar interface between the two layers at one elevation over the substrate as opposed to non-planar interface at another elevation are not apparent, would involve only routine skill in the art. The mere fact that a given layer is integral does not preclude its consisting of various elements. *Nerwin v. Erlichman*, 168 USPQ 177, 179 (PTO Bd. of Int. 1969).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

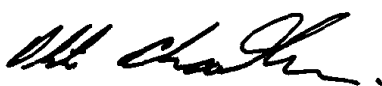
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the

Art Unit: 2823

THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Paper related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication of earlier communication from the examiner should be directed to **Kurt Eaton** at **(703) 305-0383** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via kurt.eaton@uspto.gov.


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